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Bamanophis, a new genus for the West African colubrid *Periops dorri* Lataste, 1888 (Reptilia: Squamata: Colubrinae)

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Bamanophis, a new genus for the West African colubrid *Periops dorri* Lataste, 1888 (Reptilia: Squamata: Colubrinae). - *Bamanophis* gen. n. is a monotypic colubrine genus from the Sahel to Guinea Savanna. It is well defined by external morphology, osteology, and hemipenis features. *B. dorri* (Lataste) shows a variety of scale and skull character states unknown in Afrotropical, Palaearctic, and Saharo-Sindian racers and related genera. Noteworthy are differences in midbody dorsal scale row number frequencies between males and females and significant sexual dimorphism of ventral counts in Senegal. The distribution of Dorr's Racer is reviewed and new locality records from Guinea and Senegal as well as ecological data are presented.

Keywords: *Bamanophis* gen. n. - *B. dorri* (Lataste) - morphology - distribution - W Africa - ecology - systematics - relationships.

INTRODUCTION

Lataste (1888) described Dorr's Racer after two specimens collected at Bakel in eastern Senegal. For the next 80 years or so, there were only three new and precise records from Mali (Angel, 1922; Werner, 1929; Villiers, 1956). Roman (1969, 1980), Hulselmans & Verheyen (1970), and Hughes (1983) reported the species from Burkina Faso, Togo, and Ghana, respectively. Recent fieldwork revealed the presence of Dorr's Racer in Benin, Guinea, and southern Mauritania (Chippaux, 1999; Nickel, 2003; Trape & Baldé, 2006).

Coluber (*sensu lato*) *dorri* (Lataste) is outstanding among western Old World racers for various morphological features and only distantly related to Afrotropical, Palaearctic, and Saharo-Sindian genera (Schätti, 1988b; Schätti & Utiger, 2001; Nagy *et al.*, 2004). Apart from *C. scorteccii* Lanza, 1963, this is the only African racer species that has not yet been thoroughly dealt with by the senior author as to its external morphological, osteological, and anatomical (hemipenis) characters and their systematic implications. This study addresses these topics as well as the geographic distribution of Dorr's Racer.

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MATERIAL AND METHODS

Twenty specimens (Appendix A) thoroughly analyzed as to pertinent morphological characters were loaned by the following institutions: The Natural History Museum (British Museum [Natural History]), London (BMNH); Museum of Comparative Zoology, Harvard University, Cambridge (MCZ); Muséum National d'Histoire Naturelle, Paris (MNHN); Musée royal de l'Afrique centrale, Tervuren (MRAC); University of Lagos, Department of Zoology, Ghana (ULG); and Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn (ZFMK). Further acronyms used in the text are HLMD (Hessisches Landesmuseum, Darmstadt), IFAN (Institut Fondamental d'Afrique Noire, Dakar), and NMW (Naturhistorisches Museum, Wien [Vienna]). Apart, this paper includes selected data (ventral, subcaudal, and midbody scale row counts, body and tail length) of 96 specimens (including MNHN 1995.9693) from the herpetological collection of the Centre de l'Institut de Recherche pour le Développement (IRD) at Dakar examined by the junior author (Appendix B).

External morphological terms are defined in Schätti (1988b) and Schätti & McCarthy (2004). Numbers in parenthesis indicate intraspecific variation. The dorsal scale row pattern is expressed in terms of ventrals and as a percentage of their total number (%ven) based on the average of the right and left side counts. In most cases, maxillary teeth were examined on the right bone. Vertebra measurements are explained in Auffenberg (1963).

Scientific names of the taxa discussed are usually cited with the author and year only at their first appearance in the text. Coordinates are from the GEONET database (http://earth-info.nima.mil), GPS location (Billaouâr, Dar El Oula, Kalekouré, Massamassa, Niamou, Pont Gambie, Tenkoto), or literature and given in the synonymy or the Appendices. For the purpose of this paper, the term Saharo-Sindian is considered of equal rank as the Afrotropical and Palaearctic regions.

RESULTS

Bamanophis gen. n.

Derivatio nominis. The genus is named after the Bamana people from Senegal to northern Ghana and the Greek word *ophis* (οφις), i.e., snake; the gender is masculine.

Diagnosis. Anterior subocular absent [present in other racers]; one comparatively large posterior subocular [smaller]. Ten (eleven) supralabials, fourth and fifth (fifth and sixth) entering eye. Dorsal scales smooth, with paired apical pits; 25-27 longitudinal rows on neck (20th ventral), 29-33 at midbody, 17 (only ♂♂) to 19 prior to anal plate; usually two or three bilateral increases in the number of dorsal scale rows on anterior part of body; reductions after midbody confined to ventrolateral and lateral levels [including paravertebral rows]. 229-265 ventral scales (clear-cut sexual dimorphism in Senegal); tail comparatively short, with 75-95 paired subcaudals. Dark X-shaped markings along the dorsum [pattern different]. 15-19 maxillary teeth, diastema distinct, last tooth laterally offset. Palatine processus of maxillary well developed and laterally rounded, lateral processus distinct. *Crista basisphenoidea* absent [usually present]. Hemipenis spinose with intermittent barbed calyces, probably bulbous when everted [sub-cylindrical]. A monotypic genus restricted to western Africa (Sahel to Guinea Savanna).

Apart from characters states indicated in brackets, *Bamanophis* gen. n. differs from Afrotropical, Palaearctic, and Saharo-Sindian racers and related genera in sexually dimorphic midbody and preanal scale rows (number) and from *Hemorrhois, Platyceps, and Spalerosophis* spp. as well as *Hemerophis socotrae* (condition unknown in *Coluber [s.l.] scorteccii* and *C. [s.l.] zebrinus*) in osteological characters (maxillary processes, basisphenoid; see Discussion, footnote 6).

Bamanophis dorri (Lataste, 1888) – Dorr's Racer [1]

Zamenis florulentus "Dum. et Bib." [Geoffroy, 1827] [partim]. - Rochebrune, 1884: 162 (Mali: Kita [13°03'N 9°29'W], "Bords du Bakoy [River, ca. 13°03'N 9°45'W], Guellé" [Gouelle, 12°06'N 4°53'W]; Senegal: Bakel; ?"M'Boul") [2].

Periops Dorri [sic] Lataste, 1888: 227 - "dans le fort et à côté du fort de Bakel, Haut-Sénégal" (incl. BMNH 1946.1.13.3, see Type Material, Morphology [smallprint], footnotes 1 and 4).

Zamenis [auct.] *dorri*. - Boulenger, 1893: [382, 383] 410 ("Bakel, Upper Senegal": BMNH specimens [4], see Type Material); Boulenger, 1920: 281 ("Senegal"); Angel, 1922: 39 (Kati ["region caillouteuse de Bélédougou", Mali]: MNHN 1921.579-583).

Z.[amenis] dorri. - Werner, 1929: [66] 72 ("Bakel, Ob.-Senegal", Kita [Mali, NMW specimen, leg. A. Weidholz, not examined], see footnote 3).

Zamenis dorri. - Angel, 1933: [645] 713, Figs 36-36a [dorsal and lateral view of head and neck] ("Soudan Français": incl. MNHN 1922.62, see Morphology [smallprint]).

Coluber dorri. - Dekeyser & Villiers, 1954: 962 ("Peuplement soudanien"); Villiers, 1956: 879 (Mali: "Bamako" [12°39'N 8°00'W, IFAN 54.5.25-26, leg. Chabeuf 1953, not examined]); Villiers, 1963: 110, Fig. 131 [dorsal view of head and neck] ("Mali"); Roman, 1969: 18 (Burkina Faso: vic. Banfora [ca. 10°38'N 4°46'W].

Coluber dorii [sic]. - Papenfuss, 1969: [285] 305 ("Senegal, Mali").

Coluber dorri. - Hulselmans & Verheyen, 1970: 200, 202 (Namoundjoga [Togo]: MRAC 29513-14, 29522-23); Villiers, 1975: 111, Fig. 151 [from Villiers, 1963] ("Mali, Haute-Volta, Ghana [without further evidence] et Togo", see Morphology [smallprint]); Roman, 1980: 99, map (Burkina Faso: Banfora area [Roman, 1969], between Kantchari [12°29'N 1°31'E] and Matiakoali [12°21'N 1°02'E, estimated from map], and south of Namounou [ca. 11°52'N 1°42'E], see Morphology [smallprint]); Joger, 1981: 330, Figs 2 and 6

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[1] "Boie's racer" as used by Trape (1997) and Trape & Baldé (2006) is a somewhat confusing appellation. Following the original dedication of the species to "M. E. Dorr, capitaine d'infanterie de marine" (Lataste, 1888), Trape & Mané (2006) adopted Dorr's Racer as vernacular name.

[2] The 'Faune de la Sénégambie' is a curious work. According to Lataste (1888), Rochebrune's (1884) "*Periops parallelus* Dum. et Bib." [Duméril *et al.*, 1854] is a questionable ("?") early mention of *Bamanophis dorri*. To conclude from the collection sites and accepted synonymy (e.g., Boulenger, 1893), this reference most certainly refers to *Spalerosophis diadema* (Schlegel, 1837). Instead, "*Zamenis florulentus*" *sensu* Rochebrune (1884) is the very first quotation of Dorr's Racer ever. Certainly, the presence at "Khorkohl" (Rochebrune, 1884), i.e., Khol (Khor) Khol (15°29'N 15°01'W) in the sandy Ferlo Region, completely devoid of stony areas, is based on a misidentification or confusion of locality. "M'Boul" is a common place name (Mboul) in western Senegal north of 14°N latitude where *Bamanophis dorri* does not occur (Fig. 5). We tentatively map the record as from Mboul (15°48'N 13°13'W) in Mauritania (NW Gorgol) on the Senegal River approximately 180 km downstream from the type locality (Bakel). It cannot be excluded that "M'Boul" is an incorrect spelling for Mbout (15°58'N 12°37'W) in Mauritania.

[habitat], 15 [photograph: dorsal view of ZFMK 20231] ("W-Mali" [between Negala and Kassaro, "Chutes du Félou" (Félou Falls)]: ZFMK 20231, 22181); Hughes, 1983: 326 [348], Figs 2 and 5 [distribution map, latitudinal range] (N Ghana incl. ca. 11°00'N 0°50'W [estimated from map]: MCZ 67900 [Nakpanduri], ULG 183-84, 190 [Gambaga], see Distribution and Ecology).

Eremiophis dorri. - Welch, 1983: 108 (see Discussion [smallprint]).

Coluber dorri. - Schätti & Wilson, 1986: 399.1-3 (review).

C.[*oluber*] *dorri*. - Schätti, 1986: 289 ("schlecht bekannte[r] Arten"); Schätti, 1988b: 111 [footnote 3] ("endemic to interior W Africa", see Morphology [smallprint]).

Haemorrhois [sic] *dorri*. - Meirte, 1992: 69 (checklist, determination key, see Discussion [smallprint]).

Coluber dorri. - Joger & Lambert, 1996: 37 [48, 50] ("Mali [...] to northern Ghana").

Haemorrhois [sic] (= *Coluber*) *dorri*. - Trape, 1997: 97 (Senegal: Bandafassi [12°32'N 12°19'W, MNHN 1995.9693], see Discussion [smallprint], footnote 1).

Haemorrhois [sic] *dorri*. - Chippaux, 1999: [92] 94, 4 Figs [unnumbered: dorsal and lateral view of head, left maxillary], map 42 [see Fig. 5] ("Du Sénégal au Niger et Bénin") and Chippaux, 2001: [100] 101 (see Morphology [smallprint]); Trape *et al.*, 2001: Tb. 2 (Bandafassi area, frequency); Trape & Mané, 2002: 149 (checklist).

Coluber (*sensu lato*) *dorri*. - Schätti & Utiger, 2001: [936] 937 (external morphology, hemipenis, see Discussion).

Haemorrhois [sic] (*Coluber*) *dorri*. - Joger & Lambert, 2002: 174 [177, 181], Tbs 3-4 (Senegal: "Tenkoto" ["12°40.38'N 12°16.54'W"], 10 km NW Kédougou ["12°36.57'N 12°14.29'W"]).

Haemorrhois [sic] *dorri*. - Nickel, 2003: Tb. 5 [p. 46] (Mauritania [Assaba]: "Guelta Met[r]aucha": ["16°33'48"N 10°45'17"W", *fide* Padial, 2006]); Trape & Mané, 2004: [5] 17, 31, Figs 1-2 [map, habitat] (Senegal [IRD]: vic. Bandafassi [incl. Ibel, Landiéni, "Nathia" (Natia), Ndébou], Kédougou, see Appendix B).

Coluber (*sensu lato*) *dorri*. - Nagy *et al.*, 2004: [227, 228] 230, Tbs 1-2, Figs 2-4 (Senegal: "Niokolo-Koba NP" [National Park, HLMD RA-2906], see Discussion).

Haemorrhois [sic] *dorri*. - Villiers & Condamin, 2005: 115, Fig. 167 [from Villiers, 1963] (see Morpholoy [smallprint] and Discussion [smallprint]); Chippaux, 2006: 106, 4 Figs [from Chippaux, 2001], map 42 [see Fig. 5] (see Morphology [smallprint], footnote 5).

Hemorrhois dorri. - Padial, 2006: 168 (from Nickel, 2003).

Haemorrhois [sic] *dorri*. - Trape & Baldé, 2006: 362 (Guinea: Kalekouré, see Appendix B); Trape & Mané, 2006: [45, 49, 51] 110, 2 Figs [dorsal and lateral view of head], map, 2 [unnumbered] Pls [Mauritania: near Billaouâr, see Fig. 2] (Mali [incl. Bangaya and Koundian (13°10'N 10°41'W, incl. IRD 2364), Niamou, Toumboula (Tomboula, 14°20'N 7°48'W, IRD 2799), see Appendix B]; Mauritania [incl. Dar El Oula (16°35'N 9°48'W, IRD 114), see Fig. 6]).

TYPE MATERIAL

Lataste (1888) described the species on the basis of a subadult (435 mm total length) and adult female ("Deux sujets femelles, un jeune et un adulte") from Bakel (14°52'N 12°31'W), a French fortress and garrison in the border triangle of Senegal with Mali and Mauritania, below the junction of the Senegal and Falémé Rivers.

Boulenger (1893) did not list preserved material but, surprisingly, gave ventral and subcaudal counts ("245-254" [including preventrals] and "84" [smaller syntype]) not mentioned in the original description of the species, and there is considerable circumstantial evidence to suggest that George A. Boulenger had full access to Fernand Lataste's notes and specimens.

"On his appointment to the posts of Professor of Zoology and Assistant-Director of the Museum in Santiago, Chili, in 1889, M. Lataste felt reluctantly compelled to abandon his projected Catalogue of the Reptiles and Batrachians of Barbary. He handed over to me the whole of his notes, with the request that I should bring out the work. The constant correspondence with my distinguished friend ever since he took up the study of that fauna, as well as my acquaintance with his collection, had prepared me for such a work [...]" (Boulenger, 1891: 93).

There is no clear indication how long the Lataste collection, and in particular the type specimens of *Bamanophis dorri*, had been in Boulenger's care. Probably, the lion's share was shipped to London before Lataste's departure to Chile in 1889 but the collection as a whole was not formally presented to the 'British Museum' at that time. This perhaps reflected Lataste's hope to work on his specimens in the future and made him consider a formal donation as premature then. By 1920, short of a realistic prospect to resurrect his endeavour, and Boulenger only months away from retirement, the decision seemed finally to have been made to register Lataste's specimens into the BMNH herpetological collection, using the prefix "1920.1.20" followed by the donator's own registration number. Thus, BMNH 1920.1.20.3742 (now 1946.1.13.3) and 1920.1.20.3785 (1946.1.14.82, not examined), the syntypes of *Periops dorri* Lataste, were integrated together with two additional topotypical specimens, i.e., BMNH 1920.1.20.4074 (not examined) and 1920.1.20.4085 (Colin McCarthy *in litt.*).

MORPHOLOGY

Head rather distinct from neck and with a broadly rounded snout; 2.37-2.83 times longer than wide. Rostral 2.0-2.62 times broader than high, hardly projecting between the internasals; the latter about the same length as, or slightly shorter than, the prefrontals. Frontal slightly bell-shaped, much wider anteriorly; 1.25-1.44 times longer than broad, 1.09-1.31 times longer than internasals and prefrontals, 0.83-1.07 times as long as parietals; lateral borders noticeably concave in BMNH 1920.1.20.4085. Posterior border of parietals usually distinctly indented, forming a >-shaped angle from the posterio-lateral edge to the median suture in, e.g., BMNH 1946.1.13.3 [syntype], MNHN 1921.579, 1922.62, 1937.57-58, MRAC 29513-14 and 29523; shape of lateral borders variable.

Nasal divided; distance from the nostril to the eye 0.86-0.98 times the length of the internasals and prefrontals. Loreal rectangular or sub-trapezoidal and distinctly longer than high, wedged in the lower part of the preocular; below touching posterior border of second and third (sometimes also anteriormost part of fourth) supralabial. Preocular single, upper portion much broader, in contact with frontal or not. Anterior subocular absent. Normally ten supralabials, eleven in MNHN 1921.582 and on left side of MNHN 1922.62; ninth (tenth) or posterior three or four largest. Fourth (upper posterior edge) and fifth (fifth and sixth) supralabial in contact with eye. Two postoculars (upper larger); with a well-defined posterior subocular below, precluding sixth and seventh (sixth to eighth) supralabial from bordering eye. IRD 177 has a small upper portion of the sixth supralabial detached on the left side, i.e., two posterior suboculars and only one (fifth) supralabial entering eye.

Lataste (1888) is incorrect in that various suboculars were present in the syntypes (see Discussion). Angel (1933) is mistaken in his statement regarding as few as nine supralabials, the third and fourth bordering the eye (see also Villiers, 1963, 1975), and the occurrence of three postoculars mentioned by these authors and others (e.g., Chippaux, 1999 etc.; Villiers & Condamin, 2005) is not supported by our data. Two well-defined posterior suboculars (instead of the situation as in IRD 177 with a detached part of a supralabial) as shown in Angel (1933: Fig. 36a, unidentified specimen) have never been observed in the material examined for this

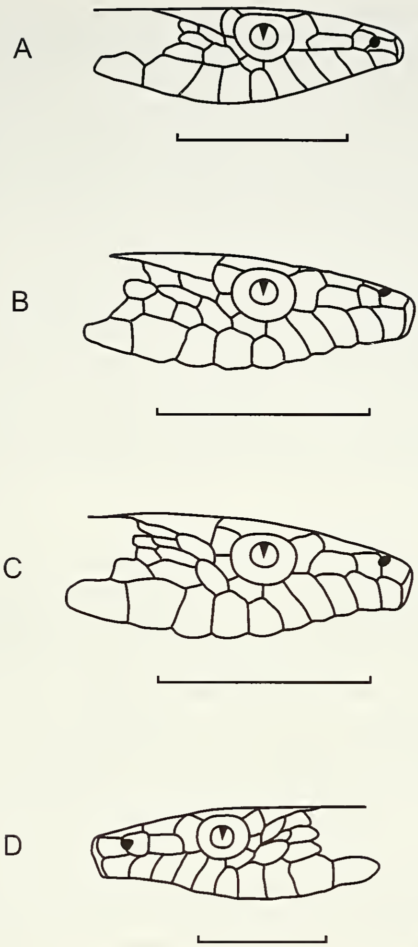

FIG. 1

Lateral head view of *Bamanophis dorri* MCZ 67900 (A), MRAC 29513 (B), MRAC 29522 (C), and MRAC 29523 (D). Line equals 10 mm. Drawings by Heidi Laubscher and Andrea Stutz.

study (see smallprint below). Roman (1980) is wrong that the species is characterized by a complete row of suboculars separating the upper labials from the eye ("sous-oculaires qui séparent l'oeil des labiales"). Schätti's (1988b: footnote 3) comment regarding the lack of "a subocular" in *Bamanophis dorri* referred to the absence of an anterior (!) subocular. Trape & Mané (2004, 2006) stated that there was no subocular at all ("pas de sous-oculaire") because they regarded this scale as the lowest of three postoculars.

Usually 2+3 temporals in first and second row; lower anterior temporal normally larger than upper and in contact with seventh and eighth (eighth and ninth) supralabial; three scales in first row on left side of BMNH 1946.1.13.3 [syntype], MNHN 1921.582, and ZFMK 20231; four in second row of MNHN 1921.582 (left), MNHN 1922.62 (right), and MRAC 29522 (both sides). Size, shape, and configuration of anterior temporals fairly variable (Fig. 1).

Contrary to Lataste (1888) and Boulenger (1893: "three anterior temporals"), the larger syntype (BMNH 1946.1.13.3) has two scales in the first row on the right side. Angel's (1933: Fig. 36a) illustration of the temporal scalation is hardly realistic (see smallprint above). This is also the case with Chippaux' (1999 etc.) drawings; the dorsal and lateral head view simply do not correspond, and two second temporals as shown in the latter's figures have not been reported by us. Trape & Mané (2004) found 2+3 anterior temporals in 126 out of 142 cases (71 specimens); the remaining counts are 2+4 (1), 3+3 (10), and 3+4 (5).

Ten to twelve sublabials, the four or five anterior in contact with first chin shield, sixth or seventh (or both) largest. Anterior and posterior pair of chin shields about equal in length and width (anterior broader in BMNH 1920.1.20.4085, 1946.1.13.3 [syntype], MNHN 1922.62, and ZFMK 22181, and shorter in MRAC 29514 and 29523). Posterior chin shields usually separated by two (none or one in some specimens) rows of normally partially concealed small scales anteriorly and usually two (three, rarely one) scales behind. Three to four (five) oblique rows of gulars between the posterior chin shields and the first ventral.

Ventrals distinctly angulate laterally (i.e., with conspicuous keels), 229-265 (♂♂ 229-248, ♀♀ 242-265) in examined specimens (Appendices A and B); anal scute divided; 75-95 (♂♂ 76-88, ♀♀ 75-95) paired subcaudals; sum of ventrals and subcaudals 308-360 (♂♂ 308-333, ♀♀ 320-360).

Boulenger (1893) gave 254 ventrals (including at least one preventral) and 84 subcaudals for the subadult syntype (BMNH 1946.1.14.82, not examined, see Type Material). Angel's (1922) mention of 231 ventrals is based on MNHN 1921.581 from Mali, a damaged and somewhat desiccated specimen; the complete number of ventrals is higher but difficult to be precisely determined.

Based on 74 specimens from the Bandafassi area (SE Senegal), Trape & Mané (2004) found significant sexual dimorphism in the number of ventrals. This is true for Senegal as a whole, i.e., males have fewer (229-242) ventrals than females (243-260). In Mali, however, the separation is less marked (236-248, 244-265) [3].

Subcaudal counts of males (76-88) and females (75-87) from Senegal are virtually identical. Females from Mali show a surprisingly wide range for subcaudal counts, i.e., 76-95 (♂♂ 80-86), and the maximum for the sum of ventrals and subcaudals (360) is definitely higher than in females from Senegal (343).

Dorsal scales smooth and subequal (first lateral row enlarged), with paired apical pits. Paravertebral rows enlarged in MRAC 29522 and ZFMK 20231. In 25-27 longitudinal rows (dsr) on neck, 29-33 at midbody (msr), and 17 (♂♂) or 19 (♂♂, ♀♀) in front of the anal scute. Scale formulae of seventeen specimens (Tb. 1) 25-29-17 (2 ♂♂), 25-31-17 (4 ♂♂), 25-31-19 (♂, 4 ♀♀), 25-33-19 (♀), 27-31-19 (2 ♀♀), or 27-33-19 (♂, 2 ♀♀).

MRAC 29523 (♀) has 27-25-27 dsr from ventral 21 to 26 (averages of right and left side, changes involving rows 5-6) and an increase to 21 immediately prior to the vent (ventral 248, 99%ven) comprising rows 2-3. MNHN 1921.579 (♀) with irregular number (27-26-27) between ventrals 28 and 36 (rows 4-5). MNHN 1922.62 (♂, right side) and ZFMK 20231 (♀, left) with alternation of 31-30-31 dsr between ventrals 99 and 105 (41.1-43.6%ven, rows 6-8) and 78-83 (32.0-34.0%ven, rows 6-7), respectively.

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[3] For this reason, the gender of Werner's (1929) juvenile from Kita ("junges Exemplar", not examined) with "248" ventrals (including one or two preventrals, 84 subcaudals) remains unknown for the time being.

TABLE 1. Dorsal scale row pattern of *Bamanophis dorri*. Accession number, sex, formula (number of transverse dorsal rows at 20th ventral, midbody [50%ven] and five ventrals prior to the vent), reduction levels (above: dorsal scale rows involved; below: longitudinal position in percent of total number of ventrals, see Material and Methods), and comment (see text regarding bold figures in the case of BMNH 1946.1.13.3, MCZ 67900, MNHN 1921.579, 1922.62, 1937.58, MRAC 29523, and ZFMK 20231). Blanks do not apply.

Accession no.	sex	formula	25-27	27-29	29-31	31-33	33-31	31-29	29-27	27-25	25-23	23-21	21-19	19-17	comment
MCZ 67900	♂	25-31-**17**	? 19.1	7+8 22.7	7-9 37.3			7+8 57.7	5+6 61.2	5-7 63.4	4+5 66.5	3-5 70.3	3+4 81.8	3+4 96.2	
MNHN 1921.580	♂	25-31-17	?	?	?			?	?	?	?	?	?	?	no further data
MNHN 1921.582	♂	27-33-19		?	?	?	?	?	?	?	?	?	?		badly damaged
MHNH 1921.583	♂	25-31-17	?	?	?			?	?	?	?	?	?	?	damaged
MNHN 1922.62	♂	25-31-17	4-6 13.5	6+7 20.8	6+7 **25.5**			7+8 57.9	5_7 59.3	6-8 61.4	4-6 63.1	4+5 66.6	3+4 73.4	3+4 93.0	
MNHN 1937.58	♂	25-29-**17**	?	?					?	?	?	?	?	?	no further data
MRAC 29513	♂	25-31-19	6+7 19.0	6+7 23.5	7+8 43.0			7+8 54.1	?	?	5+6 65.6	5+6 70.7	4+5 81.6		
ULG 190	♂	25-29-17	?	?				58.0	6-8 60.8	6+7 65.2	5+6 68.6	4+5 78.7	3+4 96.6	4+5	
BMNH 1920.1.20.4085	♀	25-31-19	5+6 16.5	5-8 21.1	6-8 35.7			7+8 55.8	5+6 59.8	6+7 62.3	3+4 65.5	4+5 71.5	3+4 89.0		
BMNH 1946.1.13.3	♀	27-**31**-19		6+7 19.1	6-8 23.8			7-9 59.4	5-7 61.4	6+7 65.0	4+5 68.5	4-6 79.7	4+5 89.6		syntype
MNHN 1921.579	♀	**27**-31-19		6+7 20.0	6+7 29.6			7+8 56.1	5+6 59.8	5+6 61.8	4+5 64.9	5+6 68.6	3+4 80.4		
MNHN 1937.57	♀	25-31-19	4+5 19.1	6-8 21.8	6+7 38.7			7+8 51.4	4+5 57.4	5+6 60.5	3+4 62.3	4+5 67.3	3+4 83.9		
MRAC 29514	♀	25-31-19	5+6 18.1	6+7 21.3	6+7 36.7			?	?	?	?	?	?		badly damaged
MRAC 29522	♀	27-33-19		6-8 18.8	6-8 23.1	8 [+8] 41.5	7+8 52.0	7+8 58.3	5+6 60.7	5-7 63.4	4+5 68.4	4+5 77.5	3-5 91.5		
MRAC 29523	♀	**27-33-19**		6+7 18.8	6-8 23.0	8+9 39.4	7+8 53.8	7+8 58.8	6+7 61.0	6+7 63.6	4 [+4] 68.2	4+5 78.0	3+4 90.6		
ZFMK 20231	♀	25-33-19	4+5 16.2	6+7 21.3	6+7 **30.5**	7+8 41.8	6+7 51.2	6-8 59.2	5+6 62.5	?	4+5 67.6	4+5 72.1	3+4 87.1		
ZFMK 22181	♀	25-31-19	?	?	?			?	?	?	?	?	?		no further data

All ninety examined specimens from Senegal have 29 or 31 msr (Tb. 2); the adult syntype (1946.1.13.3, ♀) shows partly 32 dsr at ventrals 110-120. A majority of males (65%) has 29 msr whereas all females except IRD 1975 (29) have 31 (see also Trape & Mané, 2004). In Mali, both sexes usually show 31 msr. The highest counts (33) were found in five individuals from Mali and Togo.

TABLE 2. Number of midbody dorsal scale rows (msr) in *Bamanophis dorri*. Data from 114 specimens (see Appendices A and B) and three additional Senegalese females, i.e., the subadult syntype BMNH 1946.1.14.82 (Boulenger, 1893), IRD 1972 (Bandafassi), and IRD 3053 (Ibel).

	29 msr		31 msr		33 msr	
	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀
Senegal (48 ♂♂, 42 ♀♀)	31 65%	1 2.5%	17 35%	41 97.5%		
Mali (10 ♂♂, 10 ♀♀)	2 20%		7 70%	8 80%	1 10%	2 20%
Ghana, Togo (3 ♂♂, 3 ♀♀)	1 33%		2 66%	1 33%		2 66%

Two or three (four in ZFMK 20231) bilateral increases in the number of dsr between ventrals 30 and 103 (13.5-43.0%ven) in males and 39-106 (16.2-41.8%ven) in females involving rows 4-9. Six or seven bilateral reductions confined to ventrolateral and lateral levels, i.e., the first three involving rows 4-9, the fourth rows 3-7, and the last two or three rows 3-6 (Tb. 1). Males have the anterior three reductions at ventrals 125-155 (54.1-65.2%ven), and the fourth to last at 152-230 (63.1-96.6%ven). In females, the values are 123-161 (51.2-65.0%ven) and 159-232 (62.3-91.5%ven), respectively. Reduction to 17 dsr in six out of eight males (not observed in females) between ventrals 223 and 230 (93.0-96.6%ven). Two males (MCZ 67900, MNHN 1937.58) restore 19 dsr immediately prior to the vent, i.e., at ventrals 235 and 238 (99.2-99.6%ven), respectively.

Longest male (IRD 15) slightly over 810 (665 + 145) mm (tip of tail missing); females attain up to 995 (800 + 195) mm (IRD 11). Smallest individuals 233 (187 + 46) mm (♂, IRD 2955) and 251 (206 + 45) mm (♀, IRD 4255), respectively. Tail/body ratio 0.21-0.26 (♂♂) and 0.18-0.24 (♀♀).

Dorsal colouration beige, greyish, light brown, or pale reddish ("lie de vin": Lataste, 1888). Head usually with irregular but symmetrical dark brown markings on pileus, in particular the supraoculars, frontal, and parietals (faint in large individuals). Supralabials speckled with brown. Nuchal spot with a median line projecting to the posterior end of the parietal suture (see, e.g., Angel, 1933: Fig. 36; Villiers, 1963, 1976: Fig. 151; Trape & Mané, 2006: [unnumbered] Pl.). A dorsal series of approximately 40-50 dark brown X-shaped markings, small light round paravertebral ocelli enclosed at the base of the acute angle of the lateral branches, and a mediolateral series of juxtaposed brownish spots. Irregular paraventral small brown or grey spots may occur. Dorsal colour pattern of juveniles definitely more developed and richer in contrast.

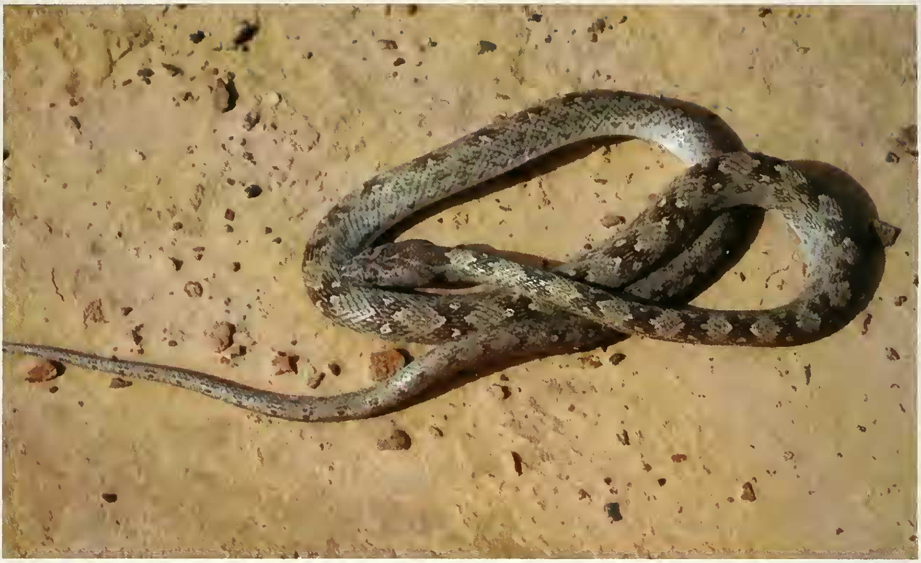

FIG. 2
Bamanophis dorri (♂, IRD 180) from the vicinity of Billaouâr (16°30'N 10°46'W), Mauritania.

Body below white, sometimes with a yellowish tinge, or reddish ("rosé"), uniform throughout or with small brownish speckles along lateral edges of ventrals.

Maxillary with 15-19 subisodont teeth; last two separated by a usually quite distinct diastema and enlarged, last tooth offset laterad; palatine processus well developed and laterally rounded, lateral processus distinct (Chippaux, 1999 [etc.]: Figs). Palatine 9, pterygoid 16-17, dentary 17 teeth (MCZ 69700 [palatine], MNHN 1922.62). Transverse ridges of basisphenoid separated, i.e., *crista basisphenoidea* absent (Fig. 3, see footnote 6). Length of midbody vertebra centrum divided by least width of neural arch 1.20-1.29, length of centrum / width across prezygapophyses between outer edge of articular facets 0.64-0.67, and length of neural crest / least width of neural arch 0.88-0.92 (MNHN 1937.57).

The *in situ* hemipenis of MCT 67900 reaches the 13th subcaudal (16%sub). The organ is spinose with intermittent barbed calyces (Fig. 4) and probably comparatively corpulent when everted.

DISTRIBUTION AND ECOLOGY

Dorr's Racer is reported from southern Mauritania (Assaba, Gorgol [see footnote 2], Hodh El Gharbi), eastern Senegal, parts of Guinea, southern Mali, and Burkina Faso to the northern parts of Ghana (in particular Northern and Upper East Region), Togo, and Benin (Fig. 5). Most probably, *Bamanophis dorri* occurs in the north of Ivory Coast as well as in SW Niger and NW Nigeria (see Hughes 1983: 348).

According to Joger (1981), *Bamanophis dorri* appears ("scheint") to be an endemic of the hilly Sudan Savanna between the Upper Senegal and Middle Niger

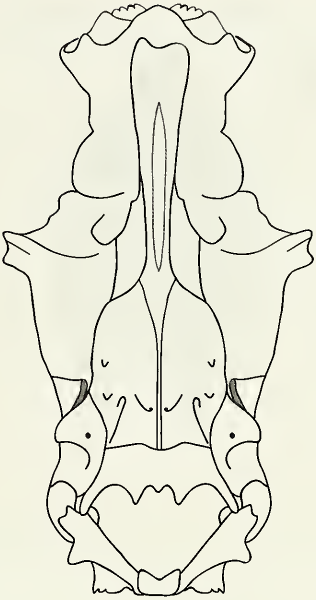

FIG. 3
Neurocranium (ventral view) of MRAC 29523. Drawing by Andrea Stutz.

Rivers ("Endemit der hügeligen Sudansavanne zwischen dem oberen Senegal und dem mittleren Niger"). Joger & Lambert (1996) "localised" the species "in wooded savanna" from Mali to N Ghana. Also considered "a typical representative of the Sahelian fauna" (Nagy et al., 2004: 230), Dorr's Racer in reality is widely distributed in open Guinea Savanna (Trape & Mané, 2006). IRD 646-G from the "wet savannah area" (Kalekouré) near Kindia (Trape & Baldé, 2006) is the record nearest to the Guinea Forest belt. Joger & Lambert (2002: 181) attributed the absence of the species "in western and central Senegal [...] to ecological [...] reasons.", i.e., the lack of suitable habitats.

Bamanophis dorri is rupicolous, found in a variety of habitats including rubble areas, rocky outcrops, cliffs, and ravines. In Senegal, the species seems to be closely associated with rocky debris (Trape & Mané, 2004: Fig. 2). Joger & Lambert (2002) reported Dorr's Racer from "man-made structures (among wall blocks) adjacent to woodland". One of the syntypes had been collected within the fortress of Bakel (Lataste, 1888). In Mali, Millet-Horsin collected five specimens (MNHN 1921.579-583) in the stony plain of "Bélédougou" near Kati (Angel, 1922). Joger (1981: Figs 2 and 6) found the species at night in rocky situations ("in felsiger Umgebung"), i.e., among dry leaf cover on a hill in open dry forest (ZFMK 20231) and on a plateau near Medine (Félou Falls), south-west of Kayes (ZFMK 22181). MCZ 67900 from Nakpanduri (N Ghana) was collected in open Guinea Savanna.

The type locality (Bakel) approximately 25 m above sea level is the lowest elevation reported for Dorr's Racer. The species is probably present at altitudes higher

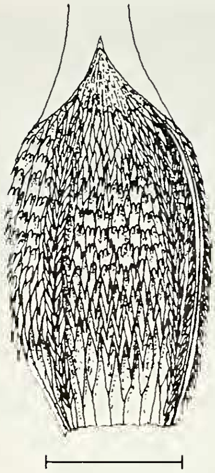

FIG. 4

Left *in situ* hemipenis of MRAC 29513. Line equals 5 mm. Drawing by Heidi Laubscher and Andrea Stutz.

than 600 m in the Mandingues Mountains (ca. 12°35'N 8°10'W), Mali. In the Fouta Djalon (Futa Jallon, ca. 11°30'N 12°30'W) of N Guinea, rocky formations usually inhabited by *Bamanophis dorri* are found up to over 1'000 m a.s.l. Four specimens from Togo (MRAC series) are from ca. 200 m a.s.l.

This is an alert and agile species of usually crepuscular or nocturnal activity; during the cooler season, particularly in the northern part of the distribution range, Dorr's Racer is also active during daytime (Trape & Mané, 2006).

The two syntypes of *Bamanophis dorri* were found on 3rd and 4th June (Lataste, 1888). ZFMK 20231 and 22181 were taken in January and March, respectively, MCZ 67900 on Christmas day, and the MRAC series end of July (Hulselmans & Verheyen, 1970). MNHN 1995.9693 from Bandafassi was obtained on 28th December (Trape, 1997), and two specimens from SE Senegal in mid-October (Joger & Lambert, 2002). The photographed specimen from Mauritania (Fig. 2) was collected soon after sunset on 11th October 2005. IRD 44 was encountered in January or February.

Bamanophis dorri preys on lizards (11 cases) and rodents (2, Trape & Mané, 2004). Out of 105 specimens (all from eastern Senegal) examined as to their food items, 76 turned out negativ (plus one not identified); five contained remains of rodents; twenty-three had fed on lizards (*Agama* spp. [4], *Hemidactylus* spp. [12], scincids [4] including *Trachylepis* spp., lacertids [3]); one case of ophiophagy (juvenile *Psammophis elegans* Shaw, 1802) was recorded. MNHN 1921.581 had an *Agama agama* Linnaeus, 1758 in its stomach. Another MNHN specimen from the vicinity of Kati was found about to swallow an "*Agama colonorum*" (*A. agama* Linn.) of such size that the oesophagus got split ("de telle taille […] qu'une éventration s'est produite ver le milieu du tube digestif", Angel, 1933). A single female was encountered gravid, i.e., IRD 2374 (date of capture unknown) with two eggs measuring 16-18 mm in length and 8 mm thick.

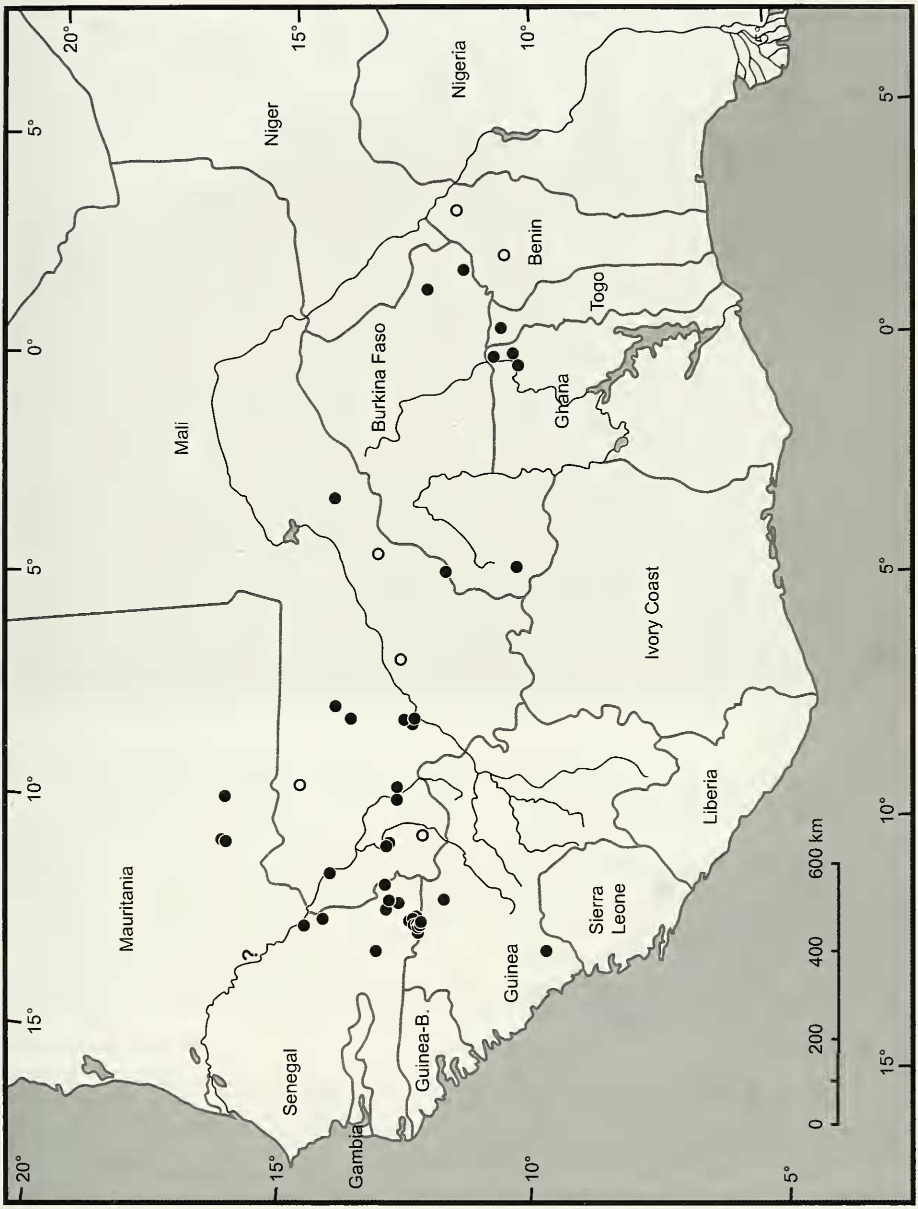

FIG. 5. Distribution of *Bamanophis dorri* based on examined material (Appendices A and B), literature records (Rochebrune, 1884; Villiers, 1956; Roman, 1969, 1980; Hughes, 1983; Joger & Lambert, 2002; Nickel, 2003), and four localities based on IRD specimens not examined for the purpose of this study from N Guinea (Pont Gambie: 12°00'N 11°49'W, IRD 3530-G) and Senegal (IRD 5558, 5684, 5687, 6409, 6750-52), i.e., Bellé (14°25'N 12°18'W), Ségou (12°25'N 12°17'W), and Wassandara (13°13'N 11°33'W). Open circles indicate six approximate collecting sites (unspecified records) in N Benin and Mali from Chippaux (1999, 2006: map 42). The question marks denotes Mboul, Mauritania (see footnote 2). Drawing by Andrea Stutz.

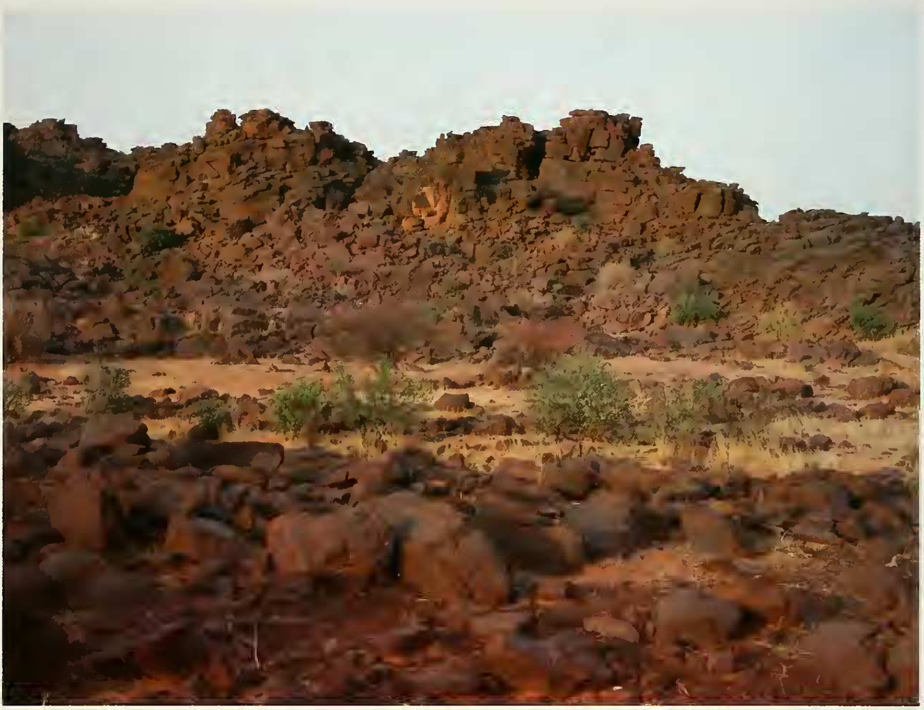

FIG. 6

Eroded sandstone habitat of *Bamanophis dorri* in the southern Affolle Mountains (Hodh El Gharbi) near Dar El Oula (16°35'N 9°48'W), Mauritania (photograph taken in April 2005).

In the Bandafassi area (SE Senegal), *Bamanophis dorri* accounts for 5,8% of all snakes collected (Trape & Mané, 2004), thus the species is at least locally abundant (74 specimens). The sex ratio in the examined material (Appendices A and B) is 61 (♂♂) to 52 (♀♀). Information regarding the sympatric herpetofauna is found in, for instance, Joger & Lambert (1996, 2002) and Trape & Mané (2004).

DISCUSSION

Lataste (1888) assigned Dorr's Racer to *Periops* Wagler, 1830, an objective synonym (same type species: *Coluber hippocrepis* Linn.) of *Hemorrhois* Boie, 1826 (Schätti, 1986). This genus is made up of the Western Mediterranean (particularly NW African) *H. algirus* (Jan, 1863) and *H. hippocrepis* (Linneaus, 1758), and two species (*nummifer, ravergieri*) from the eastern Mediterranean to Central Asia and Pakistan [4].

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[4] As to the systematic scope of *Periops* Wagler, Lataste (1888) relied on Jan (1863). The 'Elenco' also includes *P.*[*eriops*] *parallelus* (syn. *Spalerosophis diadema*, see footnote 2) with, for instance, advanced fragmentation of the lateral head scales (Schätti & McCarthy, 1987). *Hemorrhois algirus* and *H. hippocrepis* often have the preocular divided and always two or more suboculars. Ultimately, Lataste (1888) allocated Dorr's Racer to *Periops* auct. because of similar proportions ("par les proportions générales"), above all the distinct separation of the head from

Boulenger (1893) included Dorr's Racer in the hotchpotch *Zamenis* auct. before Dekeyser & Villiers (1954) formally assigned the species to *Coluber* auct., another systematic jumble and actually a Nearctic genus. *Eremiophis* Fitzinger, 1843 (Welch, 1983) is a *nomen dubium* (Schätti, 1987: footnote 2, 1988a, 1993a). By and large, Meirte (1992) followed Welch's (1982) concept for African racers. The latter author referred all taxa known to him to "*Haemorrhois* Boie 1826" (actually, *Periops dorri* Lataste is missing in this highly deficient and obsolete compilation). "*Haemorrhois* (= *Coluber*) *dorri*" (Trape, 1997; Joger & Lambert, 2002) is based on these two "authorities" (see also, e.g., Chippaux, 1999 etc.; Villiers & Condamin, 2005; footnote 5). This spelling is Boie's (1827) unjustified emendation of *Hemorrhois* Boie, 1826 (Schätti, 1988a; Williams & Wallach, 1989).

Lataste (1888) averred that the single preocular scale of *Bamanophis dorri* excludes ("écarte") Dorr's Racer from *Hemorrhois* and *Spalerosophis* spp. (i.e., *Periops* auct.). Zoogeographic considerations, i.e., the mainly Palaearctic distribution ("les espèces [...] ne sont authentiquement connues que de la région paléarctique, descendant tout au plus (*Periops parallelus*) jusque dans le Sahara", see footnotes 2 and 4) further nurtured his doubts regarding the relationships of Dorr's Racer. The intrinsic problem with Lataste's (1888) generic allocation is that he was incorrect in his statement regarding the alleged presence of various (!) suboculars ("présence de sous-oculaires") in *B. dorri*; this declaration is made in the introduction and not confirmed by the text of the descriptive part ("Dix sus-labiales, les quatrième et cinquième bordant l'oeil"). If he had not committed that error, Lataste (1888) probably would have come to a different conclusion as he clearly contemplated a new genus for Dorr's Racer ("on pourra penser que l'espèce décrite ici donnerait également lieu à la création d'un genre nouveau"). Instead, he anticipated Boulenger's (1893 [etc.]) revision of snake genera in the "Catalogues of the British Museum" and, as *ad interim* measure ("provisoirement"), assigned the new species to *Periops* auct. (see Type Material, footnote 4).

Based on scale features and hemipenis ornamentation, Schätti & Utiger (2001: 937) concluded that Dorr's Racer may be only distantly related to African racers, in particular *Hemorrhois* spp. and those of the genus *Platyceps* Blyth, 1860. Without taking into account the enigmatic *Coluber [sensu lato] scorteccii* Lanza, 1963 from Somalia, these two genera include all except two geographically isolated African species, i.e., *Hemerophis socotrae* (Günther, 1881), a monotypic genus from the Sokotra islands, and the yet unassigned *Coluber* [*s.l.*] *zebrinus* Broadley & Schätti, 1999 from arid SW Africa. Based on nucleotide sequences, and in accordance with the long isolation of the archipelago from the African continent, *H. socotrae* branched off from a hypothetical ancestral stock prior to the radiation leading to recent Old World racer genera discussed in this paper (Schätti & Utiger, 2001: Figs 8-9; Utiger *et al.*, 2005: Fig. 3). Molecular (mtDNA) data also demonstrate that *C.* [*s.l.*] *zebrinus* belongs to a lineage that diverged prior to the evolution of Afrotropical, Palaearctic, and Saharo-Sindian racers and related genera; its sequence divergence (*p*) vis-à-vis *H. socotrae* is 14,5% (Schätti & Charvet, 2003; Schätti & Monsch, 2004).

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the neck, the scalation ("l'écaillure"), in particular ("notamment") the presence of "suboculars" (in contradiction with the description), a large number ("le grand nombre") of supralabials and dorsal scale rows, as well as distinctly keeled ventrals and even ("voire meme") its overall colour pattern ("son système de coloration"), i.e., similarities in the irregular head markings on the vertex and the basic arrangement of the dorsal pattern ("la disposition élémentaire du dessin").

According to Nagy *et al.* (2004: 227), "*Coluber* s.l. *dorri*" is a member of "the most basal" clade of "Old World racers" including "*C. s.l. zebrinus*" and *Macroprotodon cucullatus* (Geoffroy, 1827) (see also Lawson *et al.*, 2005), the "sister taxon" to Dorr's Racer. Their separation from the common ancestor "was likely brought about by the emerging Sahara desert", and the subsequent evolution of grooved posterior teeth in *Macroprotodon* Guichenot, 1850 "has little bearing on phylogeny" but "precludes the inclusion of dorri in that genus" [5].

The absence of an anterior subocular and paravertebral dorsal scale row reductions, sexually dimorphic reduction features (number of midbody and preanal scale rows), and the hemipenis (at least the shape) morphologically separate Bamanophis from Afrotropical, Palaearctic, and Saharo-Sindian racers and their allies discussed in this paper, i.e., *Coluber* [s.l.] *zebrinus*, *Hemerophis socotrae*, and *Hemorrhois*, *Platyceps*, and *Spalerosophis* spp. [6]. Based on the drawings in Chippaux (1999 etc.), the maxillary of *B. dorri* differs from, for instance, *H. hippocrepis* and *H. socotrae* in the form of the palatine and lateral processes (Schätti, 1993b: Fig. 24; Schätti & Utiger, 2001: Fig. 3).

Potentially ancestral (plesiomorphic) character states shared by the new genus and *Macroprotodon* include, for instance, the lack of an anterior subocular and paravertebral scale reductions ("Exceptionally" present in *Macroprotodon*; Wade, 2001). The latter differs from *Bamanophis* in a variety of characters including lateral head scales (e.g., posterior subocular [absent in *Macroprotodon*], number of temporals), midbody dorsal scale rows (19-23 [25] vs. 29-33), dentition (opisthoglyph vs. aglyph, and position of the diastema), and skull features such as, e.g., the situation of the Vidian foramen (Underwood, 1967: 112) (Wade, 1988, 2001).

A more detailed understanding of the phylogenetic relationships of the monotypic genera *Bamanophis* and *Macroprotodon* vis-à-vis other colubrine clades requires further morphological and molecular investigations including sub-Saharan genera. By all means, a "Palearctic [sic] origin" of Dorr's Racer as asserted by Papenfuss (1969) is in need of confirmation.

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[5] Discussing the results of Nagy *et al.* (2004), Chippaux (2006) concluded that Dorr's Racer should be placed ("devrait appartenir") in *Macroprotodon*. However, the former authors clearly stated that their molecular data "indicate a considerable independent phylogenetic history for each of these taxa."

[6] The separation of the transverse ridges of the basisphenoid in the *area centralis* (Fig. 3) distinguishes Dorr's Racer from *Hemorrhois*, *Platyceps*, and *Spalerosophis* spp. (see Schätti, 1987: Fig. 1). The *crista basisphenoidea* is weakly developed in *Hemerophis socotrae* (Schätti & Utiger, 2001: Fig. 5). The condition in *Coluber* [s.l.] *zebrinus* is unknown (this is also the case with hemipenis characters). Vertebra ratios of *Bamanophis dorri* are close to those observed in *Hemorrhois* spp. (Schätti, 1987: Tb. 1, Fig. 2).

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Appendix A

Bamanophis dorri examined for the purpose of this study. Ghana: MCZ 67900 (Nakpanduri, 10°38'N 0°11'W, ♂); ULG 183-184 ("Ghana", juveniles; only maxillary teeth counts), 190 (Gambaga, 10°32'N 0°27'W, ♂). Mali: MNHN 1921.579-583 (vicinity of Kati, 12°45'N 8°04'W, 3 ♂♂, ♀♀, leg. Millet-Horsin), 1922.62 ("Haut-Sénégal Niger", ♂, leg. Fertelle), 1937.57-58 (Falaises de Bandiagara [B. Cliffs], 14°25'N 3°19'W, ♂♀, leg. de Ganay); ZFMK 20231 (between Negala and Kassaro, 12°55'N 8°40'W, ♀), 22181 ("Chutes du Félou" [F. Falls, south-west of Kayes], 14°21‘N 11°21‘W, ♀). Senegal: BMNH 1920.1.20.4085 (Bakel, 14°52'N 12°31'W, subad. ♀), 1946.1.13.3 (Bakel, ♀ syntype). Togo: MRAC 29513 [field tag 1167] and 29514 [1168], 29522 [1184] and 29523 [1187] (Namoundjoga, 10°53'N 0°24'E, ♂, 3 ♀♀, coll. Verheyen *et al.*).

Appendix B

IRD specimens of *Bamanophis dorri* (sex, number of ventrals, subcaudals, and midbody scale row counts; a plus sign [+] denotes an incomplete tip of tail. An asterisk (*) indicates new locality record). Guinea. *Kalekouré* (9°55'N 12°48'W): 646-G (?, 243, -, -). Mali. *Bangaya* (13°14'N 10°43'W): 1 (♀, 259, 84, 31), 9 (♀, 262, 93, 31), 11 (♀, 265, 95, 31), 14 (♂, 245, 86, 31), 15 (♂, 238, 86, 31), 19 (♀, 264, 83, 31), 23 (♂, 248, 80, 31), 26 (♂, 237, 83, 29), 28 (♀, 260, -, 31), 31 (♂, 247, 86, 31). *Niamou* (14°01'N 8°03'W): 44 (♀, 249, 80, 33). Senegal. *Bandafassi* (12°32'N 12°19'W): 163 [now MNHN 1995.9693] (♂, 232, -, 31), 1951 (♂, 238, 83, 29), 1974-75 (♀♀, 253, -, 31; 258, 78, 29), 1982 (♂, 230, 80, 29), 1985 (♀, 245, 79, 31), 1993-94 (♂♂, 234, 83, 29; 239, 83, 31), 2537 (♀, 252, 87, 31), 2540 (♂, 236, 79, 29), 2545 (♀, 251, 75, 31), 2562 (♀, 254, 72+, 31), 2588 (♂, 240, 88, 29), 2594 (♂, 242, 76, 29), 2629 (♀, 242, 79, 31), 4347 (♂, 241, 87, 29), 4357 (♀, 250, 81, 31), 4378 (♂, 232, 85, 31). **Gamon* (13°20'N 12°55'W): 4632 (♀, 247, 79, 31). *Ibel* (12°31'N 12°23'W): 1755 (♀, 257, 83, 31), 1762 (♂, 237, 84, 29), 1769 (♂, 233, 86, 29), 1772 (♂, 233, 85, 29), 1775 (♀, 252, 84, 31), 1777 (♂, 240, 88, 31), 1783 (♀, 252, 80, 31), 1785-86 (♂♀, 231, 81, 29; 253, -, 31), 1793 (♂, 237, 82, 31), 2902 (♂, 240, 85, 31), 2907 (♂, 235, 81, 29), 2917-18 (♂♀, 231, 83, 29; 245, 87, 31), 2922 (♀, 256, 82, 31), 2924 (♂, 235, 83, 31), 2927 (♀, 248, 82, 31), 2934-35 (♂♂, 238, 82, 29; 237, 81, 29), 2938 (♀, 259, 84, 31), 2951 (♂, 235, 84, 31), 2955 (♂, 234, 83, 31), 2957 (♂, 235, 84, 31), 2962 (♂, 234, 83, 29), 2994 (♂, 235, 82, 29), 2998-99 (♀♀, 250, 78, 31; 253, 79, 31), 3003 (♀, 251, 78, 31), 3007 (♀, 250, -, 31), 3009 (♂, 240, 81, 29), 3039 (♀, 242, 87, 31), 3044 (♂, 240, 81, 29), 3073 (♂, 238, 83, 29), 3085 (♀, 245, 78, 31), 3089-90 (♂♂, 240, 78, 29; 239, 84, 29), 4161 (♂, 232, 82, 29), 4178 (♀, 248, 78, 31), 4206 (♂, 235, 79, 31), 4232 (♂, 236, 85, 29), 4235 (♂, 234, 81, 29), 4255-56 (♀♀, 246. 81, 31; 256, 85, 10), 4261 (♂, 233, 82, 29). *Kédougou* (12°33'N 12°11'W): 1733 (♂, 229, 79, 29). *Landiéni* (12°33'N 12°22'W): 1871 (♀, 249, 79, 31), 1876 (♀, 245, 78, 31), 1911 (♂, 234, 81, 31), 2112 (♂, 237, 81, 31), 2373-76 (4 ♀♀, 253, 83, 31; 250, 82, 31; 253, 80, 31; 247, -, 31), 2378 (♂, 232, 83, 29), 2380-81 (♂♀, 234, 80, 29; 249, 78, 31). **Mamakono* (13°11'N 12°03'W): 4501 (♂, 231, 85, 31). **Massamassa* (12°55'N 11°55'W): 4543 (♂, 231, 81, 31), 4580 (♀, 244, 80, 31). *Natia* (12°28'N 12°21'W): 2682 (♀, 250, 76+, 31), 2743 (♂, 231, 79, 31), 2751 (♂, 230, 83, 29), 2823 (♀, ?, 76, 31). *Ndébou* (12°31'N 12°26'W): 3266 (♂, 242, 85, 29). **Sambarabougou* (13°07'N 11°51'W): 5454 (♂, 233, 84, 31).